

ABSTRACT

The present invention aims to provide an electromagnetic wave frequency filter capable of transmitting an electromagnetic wave having a predetermined frequency between two waveguides with a high level of efficiency. This object is achieved by the following construction: A resonator 15 that resonates with the electromagnetic wave having the predetermined frequency is located between an input waveguide 13 and an output waveguide 14 and close to the two waveguides. The output waveguide 14 is designed so that it extends parallel to the input waveguide 13 within a predetermined section 18 located in proximity to the resonator 15, and its distance from the input waveguide 13 in the other section is larger than that in the predetermined section 18. This construction allows the electromagnetic wave having the predetermined frequency to be transmitted between the input waveguide 13 and the output waveguide 14 via the resonator 15, while preventing the other electromagnetic waves having different frequencies from being transmitted between the input waveguide 13 and the output waveguide 14 outside of the predetermined section 18. The present electromagnetic wave frequency filter can be preferably constructed using a two-dimensional photonic crystal.